

Thickening

Liquid hard surface cleaners are available in a broad variety of different formulations meeting more or less completely different requirements. The vast number of today's products can be broken down into three categories:

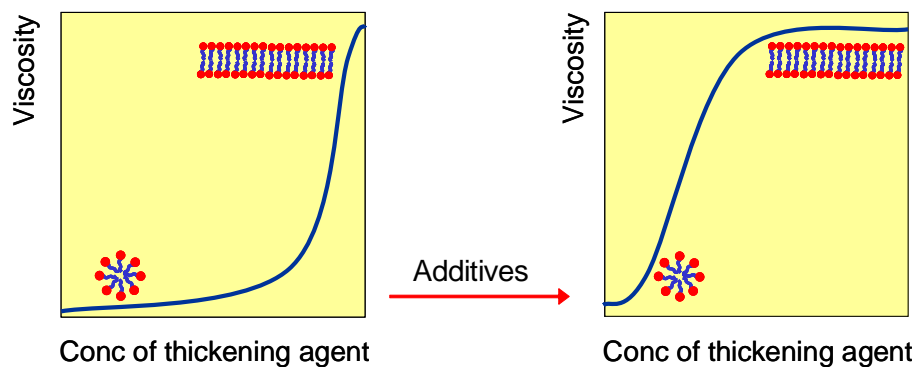
- ◆ Acidic cleaners
- ◆ Bleach cleaners (alkaline, neutral or acidic)
- ◆ Alkaline cleaners (all purpose)

More and more formulations are thickened to increase the contact time on inclined or vertical surfaces like toilet bowls, tile walls etc.

The longer adherence, the better result on soil and limestone. Furthermore the higher viscosity of these products allows an improved control of dosage. Last but not least, thickened products promote high activity levels hence giving increased effectiveness.

The guiding principle to understand the function of cationic surfactants as thickening agents, is the model of rod micelle formation. Viscosity increase is due to chaotic worm like arrangement of molecules in solution. The longer the chain length of the hydrophobe the higher the viscosity.

With small amounts of properly chosen desolubilising or solubilizing additives you can decrease the amount of cationic surfactant needed to achieve a certain viscosity level.



Thickening Agents

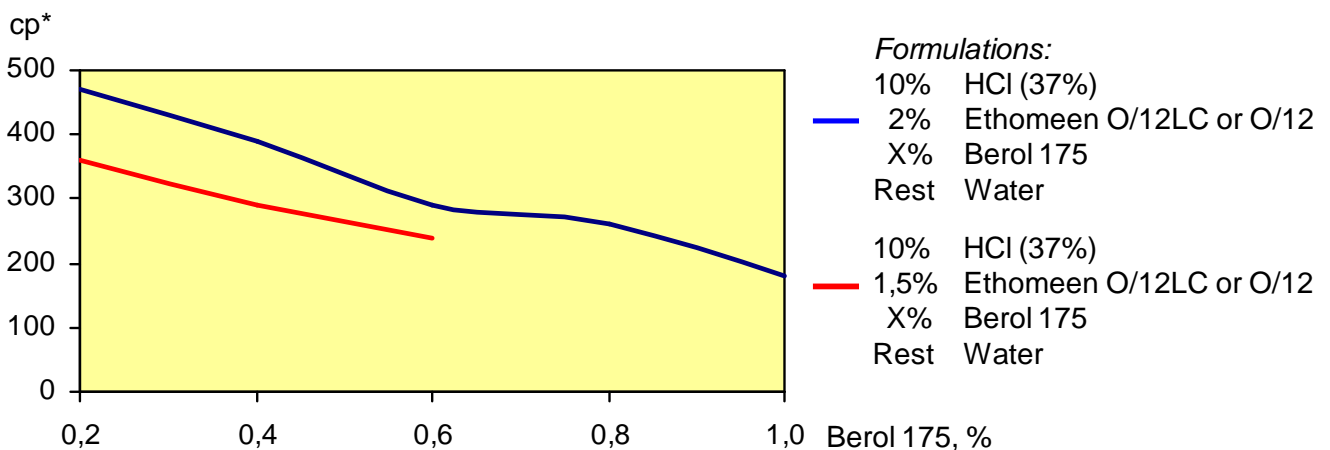
Ethomeen O/2, O/12LC
 Ethomeen T/12, T/12E
 Aromox T/12
 Aromox 14D-W 970, B-W 500
 Arquad 16-29
 Arquad T-50

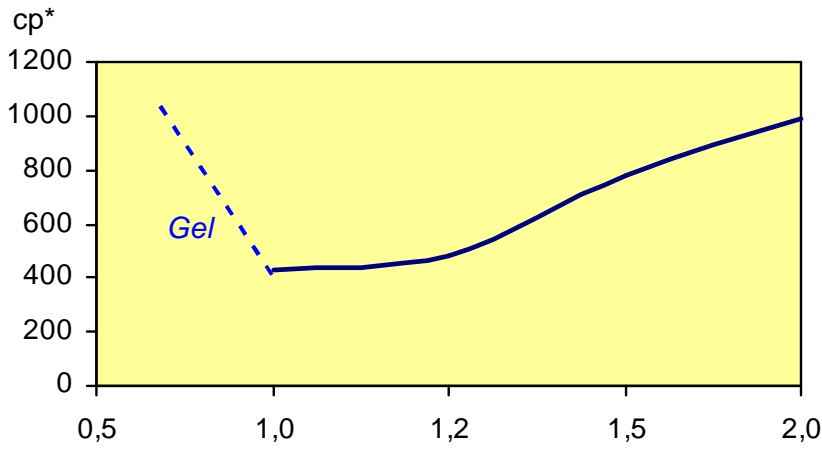
Application

Acidic cleaners
 Acidic cleaners
 Acidic cleaners, high alkaline cleaners, neutral cleaners
 Highly alkaline cleaners, hypochlorite cleaners
 Hydrogen peroxide cleaners, acidic cleaners
 Acidic cleaners, alkaline cleaners

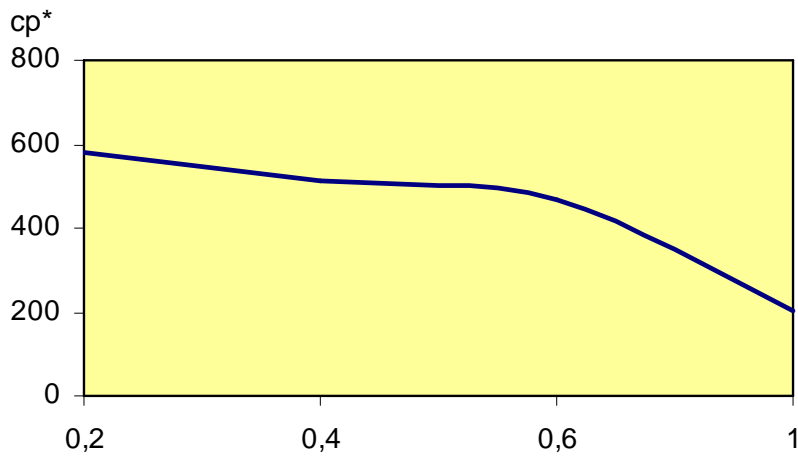
On the following pages we present thickening guidelines based on our products for different types of cleaners. Please note that if other components, i.e. fragrances etc, are added to a formula, the rheological behaviour could be affected.

Formulations with HCl



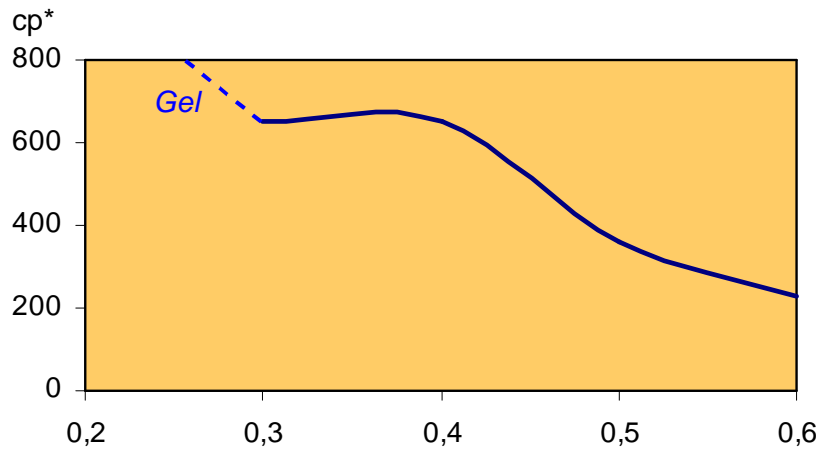


Formulation:
 10% HCl (37%)
 1% Ethomeen T/12 or T/12E
 X% Aromox T/12
 Rest Water

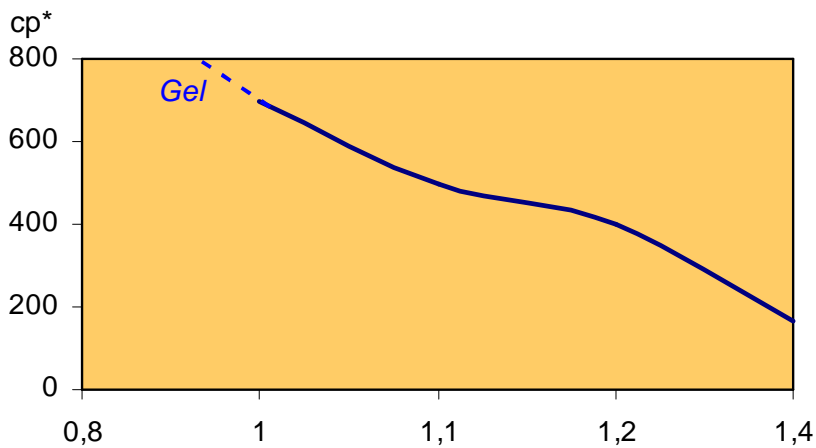


Formulation:
 10% HCl (37%)
 2% Aromox T/12
 1.5% Arquad T-50
 X% Berol 175
 Rest Water

Formulations with Phosphoric Acid



Formulation:
 10% Phosphoric acid (85%)
 2% Ethomeen O/12LC or O/12
 1.5% SXS (40%)
 X% Berol 175
 Rest Water

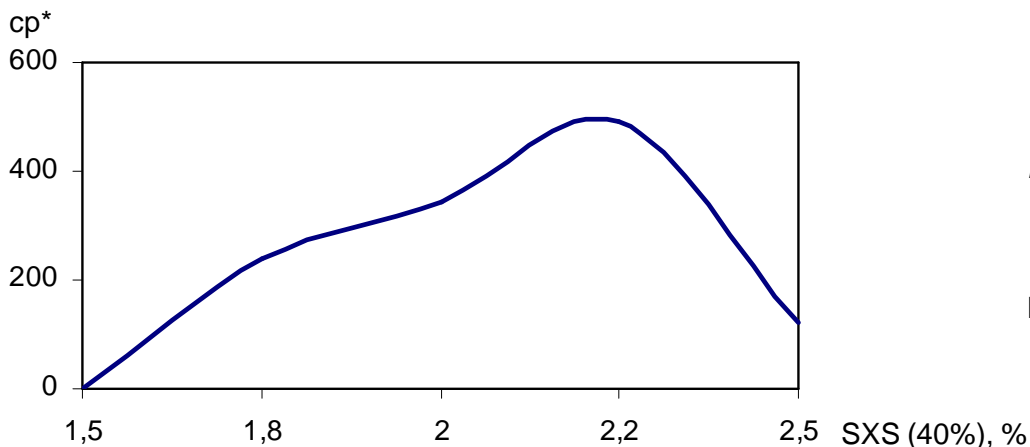


Formulation:
 10% Phosphoric acid (85%)
 3% Aromox T/12
 1% SXS (40%)
 X% Berol 175
 Rest Water

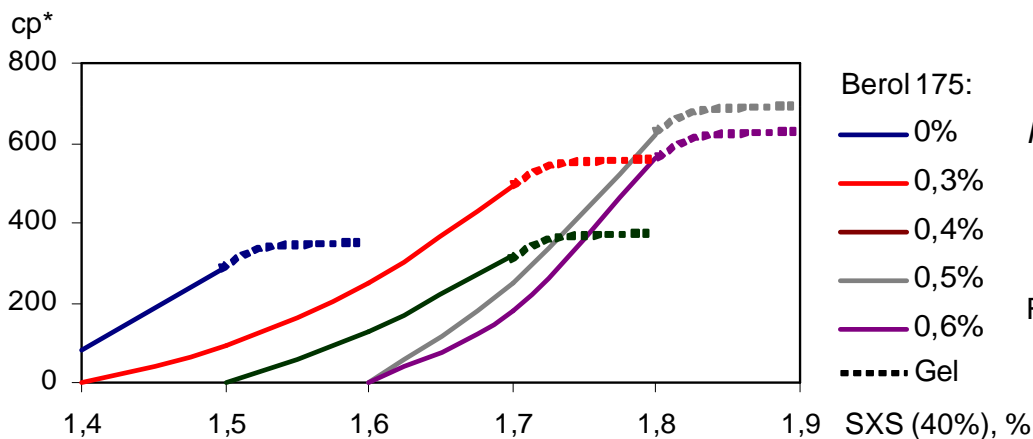
*Viscosity cp, Brookfield DV-1, Spindle 34, RPM 50

SXS = Sodium Xylene Sulphonate

Formulations with Citric Acid



Formulation:
 5% Citric acid
 3% Arquad T-50
 X% SXS (40%)
 Rest Water



Berol 175:

- 0%
- 0,3%
- 0,4%
- 0,5%
- 0,6%
- Gel

Formulation:
 3% Citric acid
 3% Ethomeen T/12E or Ethomeen T/12
 X% SXS (40%)
 Rest Water

Bleach Cleaners

Ingredient, %	NaOCl		Hydrogen Peroxide	
	Balance			
Water	Balance			
Aromox B-W 500	3,0			
Aromox 14D-W 970		4,0		
Arquad 16-29			5,0	4,0
Berol 175			0,1	0,1
Fatty Acid (Kortacid C70)	1,0			
NaCl	3,0			
NaCO ₃		4,0		
NaOH (100%)	1,0	0,5		
SXS (40%)			1,5	1,5
Sulfamic Acid				3,0
NaOCl (15%)	8,0	70,0		
Hydrogen peroxide (30%)			16,7	16,7
Viscosity cp, Brookfield DV-1 Spindle 34, RPM 50	~350	~450	~350	~200

Alkaline Cleaners

Ingredient, %	NaOH		
	Balance		
Water	Balance		
Aromox T/12	2,0		
Aromox 14D-W 970			4,0
Arquad T-50		2,0	
SXS (40%)		1,0	1,0
NaOH (100%)	20,0	5,0	5,0
Viscosity cp, Brookfield DV-1 Spindle 34, RPM 50	~400	~350	~300

The formulations recommended in the brochure are to be seen as guidelines. Akzo Nobel strongly recommends the customer to check fitness for purpose in each individual case.

For additional information and assistance, please contact your local Akzo Nobel Sales Representative or consult our website at

